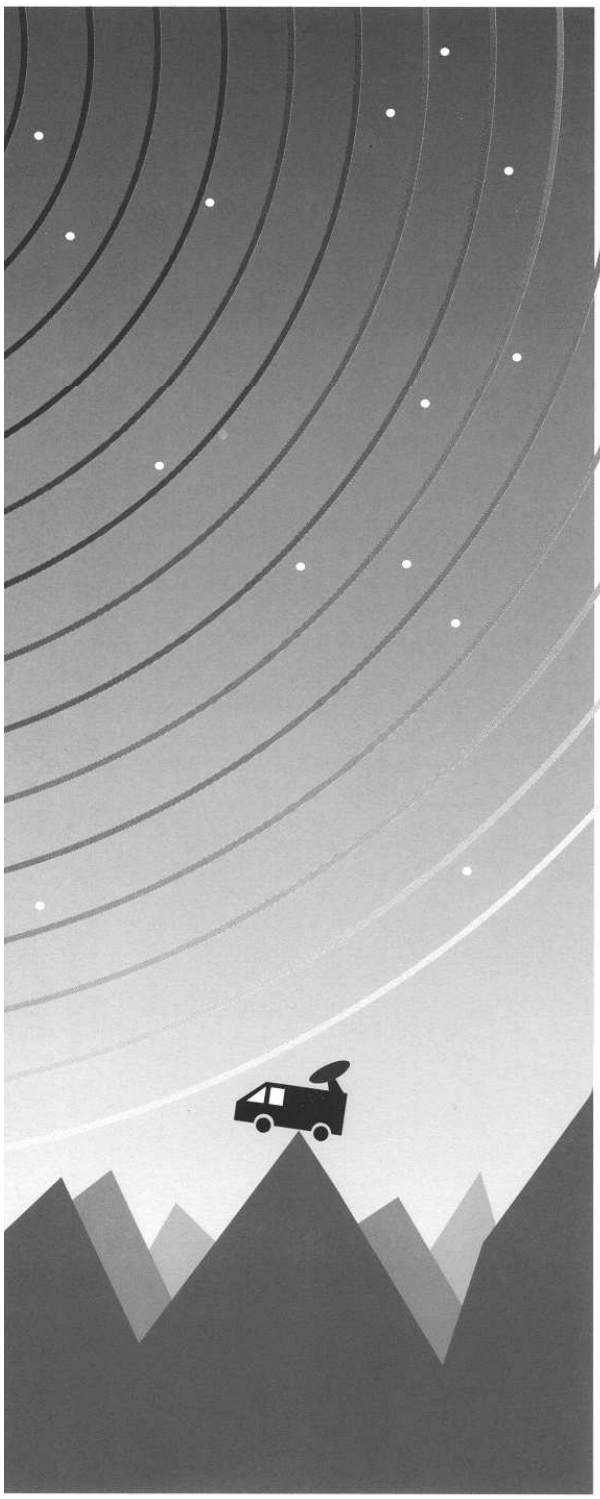
CRYSTOP DISPLAY GMBH



AUTOSAT

CONTROL

- Intelligent satellite Receiver System for Motor Homes and Caravans
- User Manual

AUS GB

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AutoSat 2 CONTROL

Dear Customer,

congratulations, that you have decided on a ***AutoSat 2 CONTROL***. This User Manual should help you, to utilise the functions of your new satellite system optimally.

We have kept the operational details as understandable as possible, while keeping them short.

The functional range of your device will be expanded steadily with software updates. That way there may be additional operational steps, which are not explained in this user manual or the operation of functions already available may change. For this reason you should visit the **Crystop** homepage *www.crystop.de* from time to time, to download the current user manual.

We wish you much joy with your ***AutoSat 2*** satellite system!

Your

Crystop Team

1 Please read this first

Before commencing the installation, check the consignment for completeness.

The following items are contained in the shipment:

1	Control unit box
1	External unit and satellite aerial (dish or flat aerial)
1	6-way connecting cable for power supply and receiver, 0.5 m length
1	12-way connector housing
4	Hexagonal screws M6 x 22 A2
4	Washers M6, A2
4	Self-locking nuts M6, A2
12	Self-tapping screws 3,9x25
1	Cable gland feed through for the roof
1	digital receiver (optional)
1	User manual

1.1 Important Note:

Before installation and start-up of your AutoSat 2, please read this user manual carefully.

Always make sure (even when your AutoSat 2 will be retracted by your starter key) that the system has really retracted when starting your vehicle. In case of interrupted supply voltage, for instance, the aerial can no longer be automatically retracted.

Very important: The external unit **must** be mounted on the vehicle roof with the aerial retracted in a direction **opposite to the driving direction,** as otherwise one cannot rule out that the aerial will be blown up by wind during high-speed driving.

When transporting the vehicle on a train, the aerial must be fixed in the retracted position by additional suitable means (expander belts, etc.), due to railway wagons being turned around when re-coupling.

Do not clean your AutoSat 2 external unit with a steam cleaner. The rubber seals used for sealing will be OK for rain and water spray but cannot survive a water jet with a pressure of several bars. The use of drive-in wash stations is deprecated and is entirely at your own risk.

A condition for satellite reception is **free sight to the satellite**, i.e. even trees cannot be penetrated by a satellite signal !!

1.2 Safety considerations

For your protection, read the safety considerations carefully before you start running your new equipment.
The manufacturer accepts no liability for damages arising from faulty handling and failure to comply with safety provisions.
If the equipment has been modified, Crystop is no longer responsible for ensuring, that the legal requirements (i.e. equipment and product safety laws, electromagnetic compatibility) are complied with. On resale of the modified equipment, the person responsible for the modification becomes the manufacturer and is liable accordingly. Furthermore the Crystop Guarantee becomes inapplicable, which may lead to a loss of warranty rights.

WARNING: In order to prevent damage to your vehicle roof, your AutoSat2 should not be operated in high winds and gusts.

AutoSat 2 is designed solely for installation and operation in motor vehicles and caravans. The D+ conductor should always be connected.

The screws of the external unit should be checked regularly for tightness.

1.3 Important operating considerations

Installation location/ Ventilation
Like any electronic device, the AutoSat control unit produces heat. However the heat produced is innocuous and is discharged effectively. Do not place any objects on the device. Maintain a space of 5 cm above the device to allow the heat produced in the device to discharge.

Do not place burning objects, i.e. burning candles on the device.

The rubber feet of the device may cause a colour change in treated furniture surfaces. If necessary, place the device on an appropriate mat.

Supply voltage
Operate the control unit with a voltage of 12 to 14.4 V DC only. Never open the device. If repair becomes necessary, it should be carried out be trained personnel.

Moisture
Protect the device from moisture, drips and splashes and do not place objects containing liquids, i.e. vases on it.

Heat/Radiation
Do not place the control unit near a heating element or in direct sun light.

In the following cases disconnect the device from the power supply and ask an expert for help:
> the device was subjected to moisture i.e. liquid got inside.
> on major malfunction.
> on major external damage.

1.4 Disposal considerations

The packaging of your unit consists exclusively of reusable materials which should be recycled.

Make sure, that empty batteries from the remote control unit are not disposed in the household rubbish, but are returned for disposal as hazardous waste to a dealer.

1.5 General considerations

Always make sure (even when your AutoSat 2 will be retracted by your starter key) that the system has really retracted when starting your vehicle. In case of interrupted supply voltage, for instance, the aerial can no longer be automatically retracted.

A condition for satellite reception is **free sight to the satellite**, i.e. even trees cannot be penetrated by a satellite signal !!

At the edges of the reception area, signal quality may be improved by turning the LNB:

South western Europe (i.e. Agadir, Canaries): turn LNB by approx.35° clockwise (looking from LNB to mirror).

North eastern Europe (i.e. Greece, Western Russia): turn LNB um approx. 15° anti-clockwise.

For Australia consult the **Intellisat** LNBF POLARISATION Satellite Signal Location Map.

2 Figure Control Panel

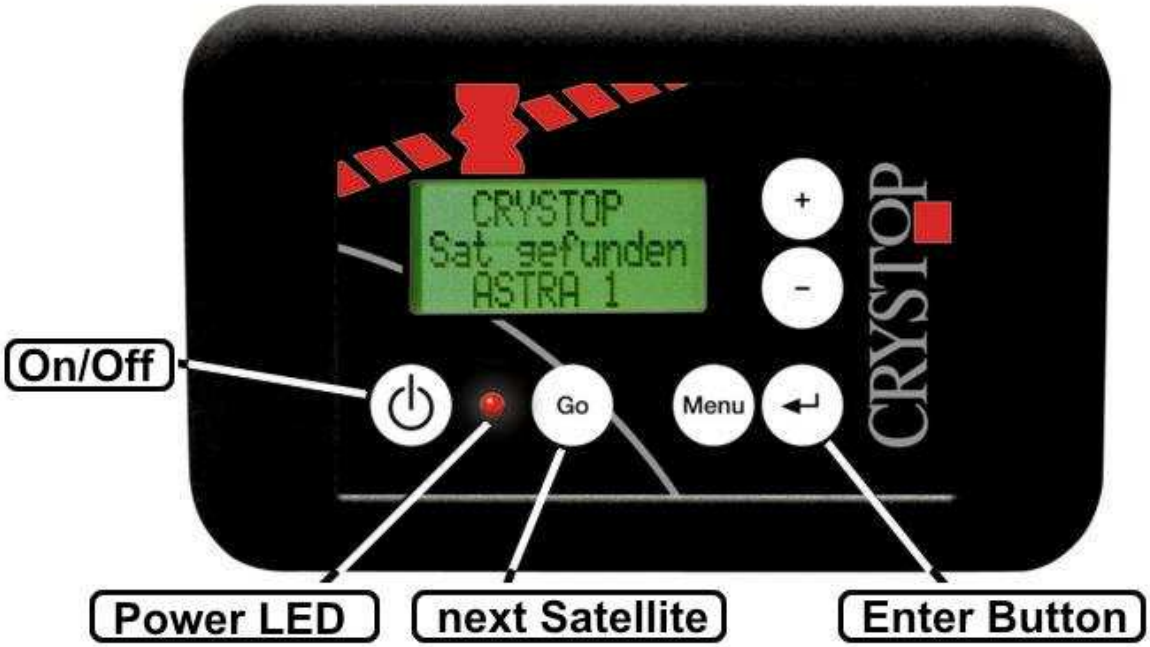
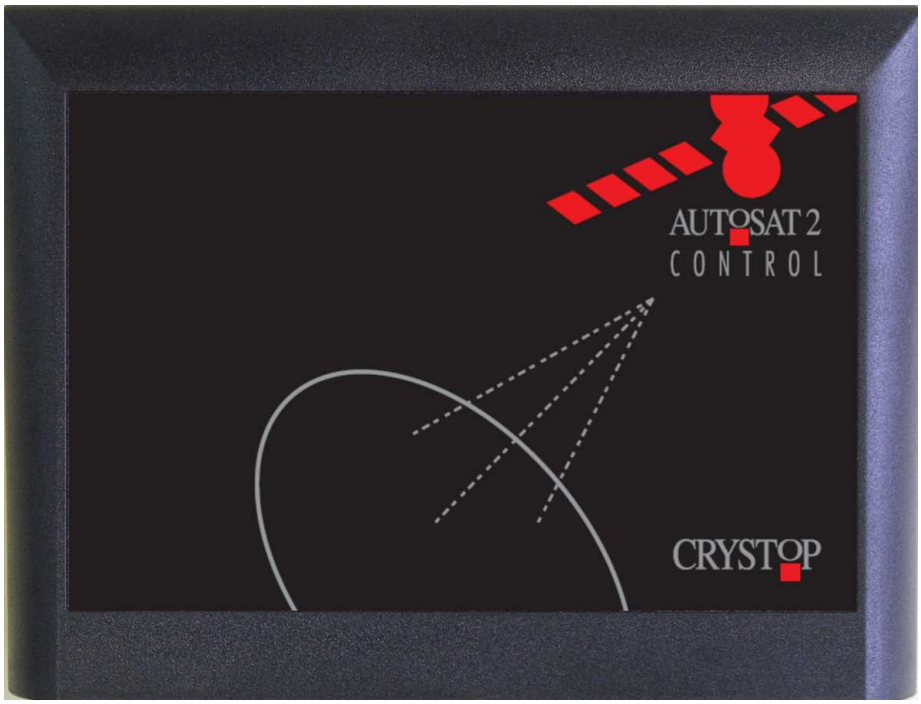


Figure Control-Box



3 Sequence of automatic satellite search

The ***AutoSat 2 Control*** satellite system is turned on with the **"On / Off" button** on the control unit. After turn on, the satellite to be searched for will be shown in the display (factory setting ASTRA1 or the last received). In the top right of the display 5 seconds are now counted down, during which time you may call up the main menu via the **"Menu" button**.

If no button is pressed, the satellite search starts (LED next to the "On / Off" button goes out).Once a satellite has been found, fine positioning is carried out. After this (LED lights up again) the words "SATELLITE FOUND" are shown in the display and the aerial signal is switched to the receiver.

Now 120 seconds of delay are counted down in the display. During this time the main menu may be called or the next satellite may be searched for. If no button is pressed within 120 seconds, the control unit switches itself off.

If the receiver is set to a program of the requested satellite, the program will now be visible on the TV set. Should this not be the case, there is a possibility, that the control unit has found a different satellite. By pressing the **"Sat" button**, the search may be continued.

AUS

AUSTRALIAN version:
to take affect you have to press down this button for longer than five seconds.

If on the other hand, the satellite system has found the right satellite and you nevertheless press the **"Sat" button**, then the requested satellite will not be found, since incorrect positions for further searches are precluded.

Therefore first check for other programs on the satellite by stepping the receiver to other TV stations for that satellite if no program is visible initially.

If you want to change to a different satellite after the control unit has switched itself off, you must switch it on again first.

After switching off the satellite receiver, the LED next to the **"On / Off" button** (or on the optional remote control) starts to blink, as a reminder, that the antenna is still extended. To retract the antenna you must activate the control unit by pressing the **"On / Off" button** once and then press it again to retract the antenna. On reaching the parking position, the AutoSat2 Control switches itself off completely.

You will find a detailed description of all functions on the following pages.

4 Operating instructions

4.1 Quick reference

Function	Description	Operation
Switch on	**“On / Off“ button**	The satellite system is switched on with the **”On / Off“ button** on the control unit or on the optional remote control unit.
Retract antenna + Switch off	**“On / Off“ button**	If the control unit is switched off (display off) the **“On / Off“ button** is pressed twice - once to switch the control unit on and another time to retract the antenna and switch off. If the control unit is already on (display on) the **“On / Off“ button** needs to be pressed only once.
Change Satellite	**“Go“ button**	If the currently found satellite is not the one you require, then a search for the next satellite is initiated by pressing the **“Go“ - button**. **AUSTRALIAN version: to take affect you have to press down this button for longer than five seconds.**
Menu button	**“Menu“ button**	By pressing the **“Menu“ button**, the main menu is displayed. All operating functions are called via the main menu. Inputs are saved by pressing the **“Menu“ button** again.
Minus button	**“Minus“ button**	The **“Minus“ button** goes one step back for Menu selection or reduces input values by 1.
Plus button	**“Plus“ button**	The **“Plus“ button** goes one step forward for Menu selection or increases input values by 1.
Enter	**“Enter“ button**	The **“Enter“ button** confirms a Menu selection.

5 Handling the operating instructions

For the button names used in the following operating instructions you will find equivalent symbols in the Quick reference (page 10) which are used on the buttons of the control unit.

e.g.:

"*On / Off*" button

In the text buttons are shown ***bold and in italics***. ***e.g.: "On / Off" button***

The figures in the text are numbered **(Fig. 1),** to maintain a clear reference to the text. Your display may vary if a different satellite is selected.

Menu texts are shown **bold**. ***e.g.:*** **"Fine pos"**

5.1 How to select a particular menu

Fig. 1

By pressing the ***"Menu"*** button you enter the Main menu.

With the ***"Plus"*** or ***"Minus"*** button you move the menu selection arrow (>) up or down until the arrow points to the required function or the corresponding sub menu. After pressing the ***"Enter"*** button, the selected function is executed or the marked sub menu is called.

You leave Main menu by pressing the ***„Menu"*** button again.

5.2 Menu details

5.2.1 Main menu

Fig. 1

To reach the Main menu, the system must be turned on. On initial turn on, **Fig. 1** will show in the display. The name of the selected satellite will be shown in the middle line. Now you have 5 seconds to press the ***"Menu"*** button. If no button is pressed within this time, the system automatically returns to stand by mode or starts a satellite search, depending on whether the system has reception or not.

Fig. 2

If the ***"Menu"*** button was pressed, **Fig. 2** will show in the display.

The following functions and sub menus are contained in the Main menu:

"Fine positioning"
"Satellite"
"Parameter"
"Search mode"
"Backlight"
"Manual Elevation "
"Manual Azimuth"
"SkewMotion"
"Manual Skew"
"Language"
"Factory setting"

5.2.2 Fine positioning

Fig. 3

On selection of the function **"Fine positioning"** the control unit optimises the alignment of the antenna to the satellite. As a rule, no "fine positioning" is necessary after a satellite search, since this function is carried out automatically at the end of the search. This function may be useful after manual positioning.

5.2.3 Satellite

Fig. 4

Fig. 5

The sub menu **"Satellite" (Fig. 4)** allows the selection of the satellite to be searched. The list of available satellites is shown
The list of available satellites is shown **(Fig. 5)**. Using the ***"Plus"*** or ***"Minus"*** button you can select the required satellite.
Confirm the selected satellite by pressing the ***"Enter"*** button. Subsequently the system will enter search mode and point the antenna to the selected satellite. If a satellite has been found, select a program on your receiver, which comes from that satellite, to check that the correct satellite has been found. If it is not the correct satellite, you may continue the search by pressing the ***"Sat"*** button. To be able to find the required satellite a clear view to that satellite is a prerequisite.

The following satellites are pre-programmed
(Name / Position / Skew):

AUS

"NSS6"	**95°**	**East**	**- 45**
„AsiaSat 4"	**122°**	**East**	**- 27**
„Measat 2"	**148°**	**East**	**+ 4**
"Optus D2"	**152°**	**East**	**- 36**
"Optus C1"	**156°**	**East**	**- 31**
"Optus D1"	**160°**	**East**	**- 26**
"Intelsat 8"	**166°**	**East**	**+ 25**
"Intelsat 701"	**180°**	**East**	**+ 37**
"USERSAT1"			
"USERSAT2"			
"USERSAT3"			
"USERSAT4"			

GB

"Türksat"	**42,0°**	**East**	**- 26**
"Hellas Sat"	**39,0°**	**East**	**-24**
"ASTRA 2"	**28,5°**	**East**	**- 1 0**
"ASTRA 3a"	**23,5°**	**East**	**- 13**
"ASTRA 1"	**19,2°**	**East**	**- 2**
"Hotbird"	**13,0°**	**East**	**- 4**
"Eutelsat W3"	**7,0°**	**Ea st**	**+ 1**
"Sirius"	**5,0°**	**East**	**+ 3**
"Thor/ Intelsat"	**1,0°**	**West**	**+ 8**
"AB3/Telecom 2C"	**5,0°**	**West**	**+ 11**
"AB2/Telecom 2D"	**8,0°**	**West**	**+ 14**
"Hispasat"	**30,0°**	**West**	**+ 28**
"USERSAT"			

5.2.4 Parameter

Fig. 6

The sub menu **"Parameter" (Fig. 6)** allows changing the search parameters of satellites to be located.

With the ***"Plus"*** or ***"Minus"*** button mark the menu point **"Parameter"**. Press the ***"Enter"*** button to reach the menu **(Fig. 7),** which allows selection of that satellite, whose parameters you want to change.

Fig. 7

By pressing the ***"Enter"*** button, you confirm your choice and will be directed to the submenu **(Figure 8)** where you can change parameters such as frequency, symbol rate, polarisation, orbit position and the skew angle. Programming an unlisted satellite is best achieved by selecting the ***"USERSAT"*** option**.**

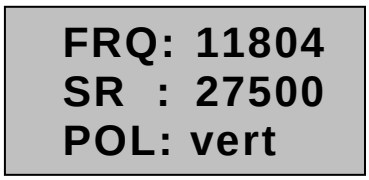


Fig. 8

As in the main menu, the modifiable parameters appear in a list. The parameter to be changed can be selected by using the **"Plus"** or **"Minus"** buttons and confirmed by pressing the **"Enter"** button.

Subsequently the currently value flashes and can now be altered by pressing the **"Plus"** or **"Minus"** buttons. Press the **"Enter"** button to accept the new value.

Otherwise press the **"Menu"** button. In doing so, the entry is cancelled and you return to the main menu **(Figure 6).** Repeat the steps above in order to change other parameters.

Inputting the skew angle is only required if the SkewMotion option is used. Entering orbit positions is currently not supported and serves for future developments, e.g. GPS.

DSQ (DiSEqC) is only used for special LNB's or switches. Normally this value is set to 0.

If you wish to look up the last satellite edited, select the satellite again from the "Satellite" menu (see 5.2.3).

5.2.5 Search mode

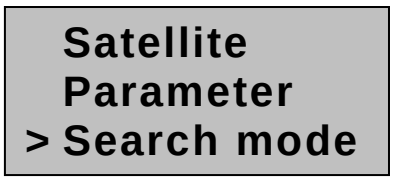


Fig. 9

In the sub menu **"Search mode"** you can change the mode from **"course"** to **"fine"**. The standard setting is **"course" (Fig. 10).** By changing to **"Fine",** the elevation increments for each rotation is reduced. This means, that the system requires more rotations to cover the whole of the elevation range. Also the sensitivity is increased, which can mean, that the systems stops more often to check a received signal. The setting **"course"** should only be changed if you have difficulty homing in on a satellite at the edge of the satellites footprint.

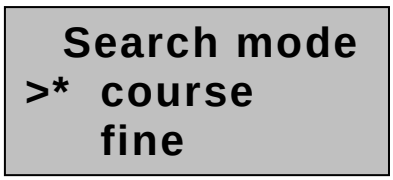


Fig. 10

If you are back to normal reception, well within the satellite footprint, the setting should be restored to **"course"**, which will reduce the time to find satellites.

5.2.6 Backlight

Fig. 11

The sub menu **"Backlight" (Fig. 11)** lets you change the background lighting of the LC display. You can select **"OFF"**, **"ON"** or **"AUTO"** mode. The standard mode is **"AUTO"**.

In the backlight mode **"ON"** the display is illuminated, as long as the control unit is switched on. In the backlight mode **"OFF"** the backlight is permanently switched off. In **"AUTO" mode** the illumination of the display switches off after approx. 60 sec, but turns on again if any key is pressed.

Fig. 12

With the ***"Plus"*** or ***"Minus"*** button you move the menu selection arrow (>) up or down to one of the modes **(Fig. 12)**. The selection is confirmed by pressing the ***"Enter"*** button. This returns you to the Main menu **(Fig. 11)**.

5.2.7 Manual Elevation of the Antenna

Fig. 13

In the **"Manual Elevation"** submenu **(Figure 14)** the antenna gradient can be operated manually.

This function is necessary for installation and service work and has no further bearing on the operation of the system.

The current position of the antenna is shown in the second row. The vertical antenna is thereby at 0 degrees and the horizontal antenna is at 90 degrees.

The third row displays the current signal reception quality.

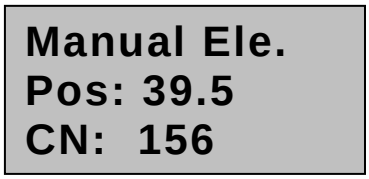


Fig. 14

The values are only updated following the release of the "***Plus"*** or ***"Minus"*** buttons. Motor control is carried out with a soft start function, i.e. the unit moves extremely sensitively when the button is first pressed and then the motor speed increases the longer the button is pressed.

5.2.8 Manual Azimuth of the Antenna

Fig. 15

The sub menu **"Man. Azi." (Fig. 16)** lets you turn the antenna manually clockwise or anti-clockwise.

This function is necessary for installation and service work and has no further bearing on the operation of the system.

The current position of the antenna is shown in the second row.

The third row displays the current signal reception quality.

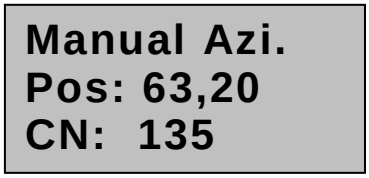


Fig. 16

The values are only updated following the release of the "***Plus"*** or ***"Minus"*** buttons. Motor control is carried out with a soft start function, i.e. the unit moves extremely sensitively when the button is first pressed and then the motor speed increases the longer the button is pressed.

5.2.9 SkewMotion (Option)

Fig. 17

Functionality can be defined here by using the SkewMotion option. If **"AUTO"** is selected, the motor device automatically moves the Low Noise Block (LNB) into maximum reception according to the location of the satellite.
If your unit is not equipped with SkewMotion, then the value will be set as **"OFF".**

5.2.10 Manual Skew (Option)

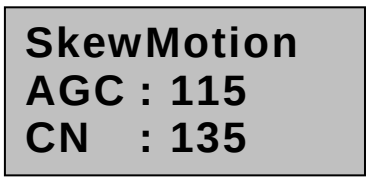


Fig. 18

The LNB can be operated manually using the SkewMotion option. Use the **"Minus"** button to move the LNB in a clockwise direction. Use the **"Plus"** button to move it in an anti-clockwise direction. Turning direction convention states that you stand behind the LNB and look into the open satellite mirror.

For every keystroke the motor moves in the chosen direction for approximately one second. The new signal strength (AGC) or the signal quality (CN) can subsequently be read in the display row below.

By pressing the **"Enter"** button the LNB automatically moves in a clockwise direction until the signal fails. It then moves in an anti-clockwise direction until the signal fails again. Then the LNB is once again moved to the maximum in a clockwise direction.

5.2.11 Language

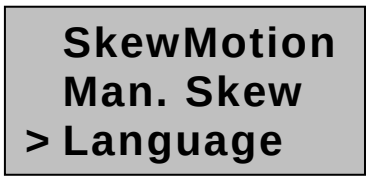


Fig. 19

The sub menu **“Language“ (Fig. 19)** (“Sprache” in german) lets you select the language for all menus. Currently available languages are: Deutsch, English, Francais, Italiano and Nederlands.

5.2.12 Factory settings

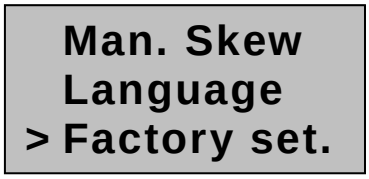


Fig. 20

Upon execution of the menu item **"Factory settings" (Figure 20),** all satellite parameters and modifiable settings will be reset to the original delivery conditions. To carry out this action, a security question will appear which you must confirm by pressing the "Enter" button.

Only execute this menu function, if the system exhibits problems, which you cannot correct any other way.

5.3 Special functions

5.3.1 Direct selection of fine tuning

By pressing and holding (for approximately two seconds) the **"Plus”** button, you can re-execute the fine tuning. As a hint, when the button has been held down for long enough, the red LED begins to flash.

5.3.2 Direct alternation between two satellites

If the **"GO“** button is pressed down for longer than five seconds, the satellite mirror goes directly to the position of the last satellite. As a hint, when the button has been held down for long enough, the red LED begins to flash. Consequently you can conveniently switch between two different satellites (e.g. ASTRA and HOTBIRD).

If you inadvertently press this button too quickly, then the current position will be shielded and the unit will try to find the same satellite again. For more information on this see also Chapter 3 (Sequence of automatic satellite search).

AUS

AUSTRALIAN version:
to take affect of the alternation between two satellites you have to press down the **“Minus”** - button for about 5 seconds until the ret LED begins to flash.

6 Mounting instructions

!!! Note:

Please read the mounting instructions before starting the installation

6.1 Choice of installation site

Initially choose sites for positioning the control unit and your receiver. Unless the control unit has a remote control option, it should be mounted, so that its display can be read and the buttons can be operated. The receiver should be as close to your TV set as possible and be seen from where you sit, since the receiver is controlled by an IR remote control. If the receiver has a remote infra red detector, the receiver may be hidden.

Please keep the following in mind:

- ensure sufficient ventilation for the control unit and the receiver
- avoid additional sources of heat in the mounting location
- ensure that the cables from the roof to the control unit fit.
- ensure that the cable from the control unit to the receiver fits.
- ensure that the cable from the receiver to the TV set fits.

6.2 External unit

When choosing the mounting location, keep in mind, that the cables to the external unit are 6 m long and that the external unit must have sufficient free space to turn.

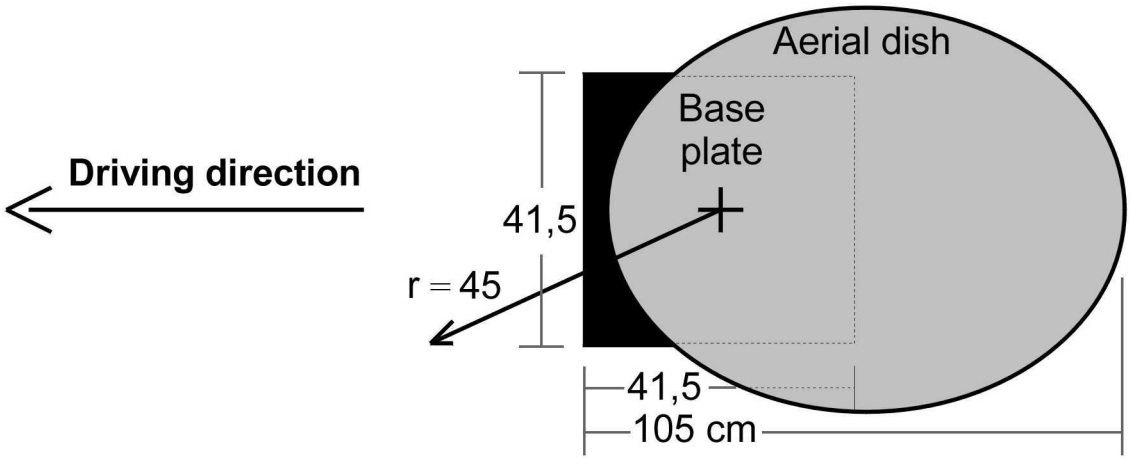
Flat aerial

The AutoSat2F (50 cm-flat aerial) has a base of 41.5 x 41.5 cm and requires a maximum radius of 25 cm for objects up to 15 cm high in search mode. For higher objects, a radius of 45 cm must be kept clear.

Dish aerial

The AutoSat2S (85 cm dish) has a base of 41.5 x 41.5 cm and requires a free area of 45 cm radius in search mode, because the LNB will be rotating just above the roof in high latitudes. The space requirement in the stationary position is shown in the following sketch:

Very important: The external unit **must** be mounted on the vehicle roof with the aerial retracted in a direction **opposite to the driving direction,** as otherwise one cannot rule out that the aerial will be blown up by wind during high-speed driving.



Now select a suitable free space on your roof. The direct vicinity of the site selected must be free from objects higher than 20 cm, which might shadow the aerial.

When this installation site has been found, once again make sure that the control unit is within a cable length of 6 m. If not, relocate the installation site or the control unit or extend the cable by an additional extension set (obtainable from us).

Please do not extend the cable without consulting us first.

6.3 Mounting the external unit

!!! Note:
Mount and secure the external unit with a fastening system, which preclude loosening or detachment of the unit under all circumstances. For sandwich roofs not offering adequate facilities for fastening, through-screws and internal counter-plates are recommended.
In case of doubt consult the maker of your vehicle.

Proceed in the following sequence:

Use Sikaflex-252 as an adhesive/sealant

1. Position external unit with the **outgoing cable** pointing towards the **rear** of the vehicle.
2. Using the base plate of the external unit as a template, drill 2 holes on diagonally opposite corners with a 2.4 mm drill.
3. Temporarily fix the external unit with two 3.9 x 25 self-tapping screws to the roof. Tighten the screws lightly, keeping in mind, that an **aluminium roof is usually thin and the screws may easily be over-tightened**, stripping the thread. Then drill the remaining 2.4 mm holes.
4. Unscrew and raise the external unit. Clean the underside and edges of the base plate and the matching roof area, removing all dirt and fatty residues. Fully coat the base plate with a 3 mm coating of Sikaflex-252 and position the external unit on the roof in the chosen position, lining up the previously drilled holes.

5. Before turning in the screws, please fill the holes with Sikaflex. Make a sealing joint around edge of the base plate. Now carefully tighten all the screws.
6. For the three outgoing cables drill a hole (min. 15 mm diameter) through the roof.
7. To fix the cables to the roof, it is recommended to use a 20 x 20 mm cable duct. Wrap the cable contacts with adhesive tape to avoid damage. Each of the 3 cables is already fitted with a grey plastic PG-gland. Unscrew the 3 narrow plastic nuts and pull them off the cables. Loosen the sealing caps on the other side of each gland. Carefully push the 3 cables with the glands through the optional 20 x 20 mm cable duct and then through the side into the cable feed through – push the 3 nuts back onto the cables - screw the glands into the holes of the feed through. Now push the cables through the roof. Fix the junction box with Sikaflex-252 and three 3.9 x 25 self tapping screws. Position and fix the cables to the roof. If using a 20 x 20 mm cable duct, attach it to the roof with Sikaflex-252, leaving enough room to reach the sealing caps of the PG-glands. Finally tighten the sealing caps.

   Figure: Cable gland feed through with cables and PG glands

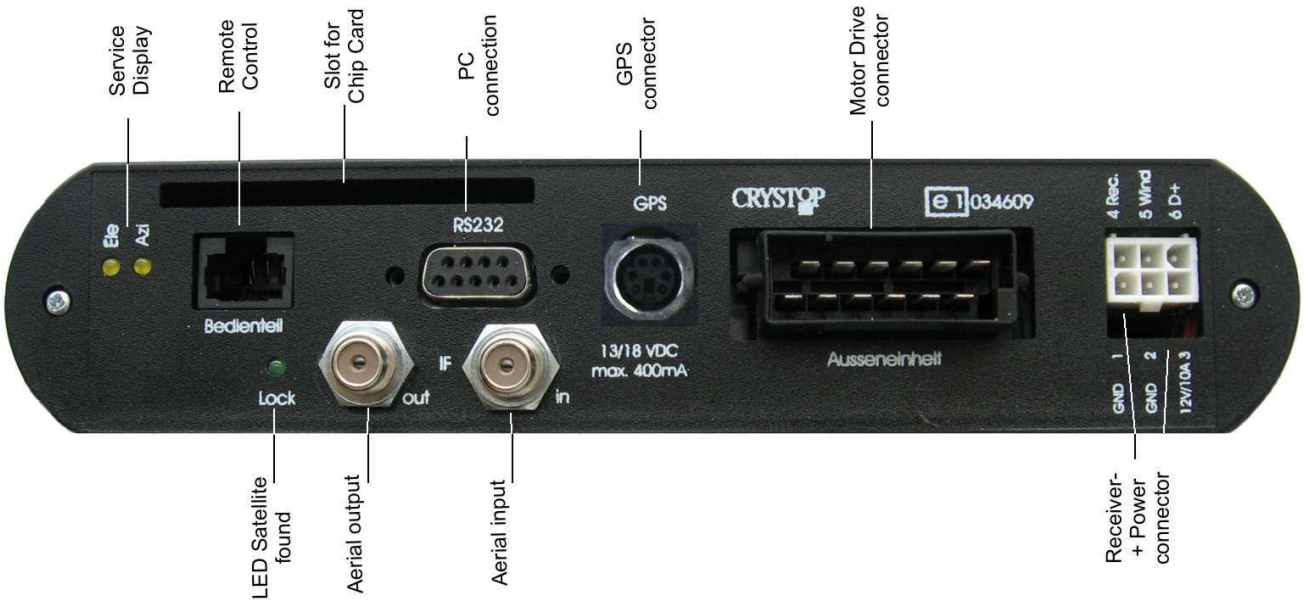
8. The aerial dish can only be fitted after the system has been connected to the power supply and is ready for operation, since the aerial arm has to be raised electrically from the parking position. Switch the AutoSat 2 on - wait until the arm has been raised sufficiently - then interrupt the power supply (remove cable). Fasten the dish with the four nuts and the **four washers** supplied.

   Flat aerial: Carefully tighten nut of aerial cable on aerial with an 11mm open ended spanner but not too tightly.

This concludes work on the roof.

6.4 Cable connection to the Control unit

6.5 Figure Control unit connectors



Lay cables from the external unit on the inside of the vehicle to the control unit. The cables should not rub on sharp edges and should not be laid close to sources of heat.

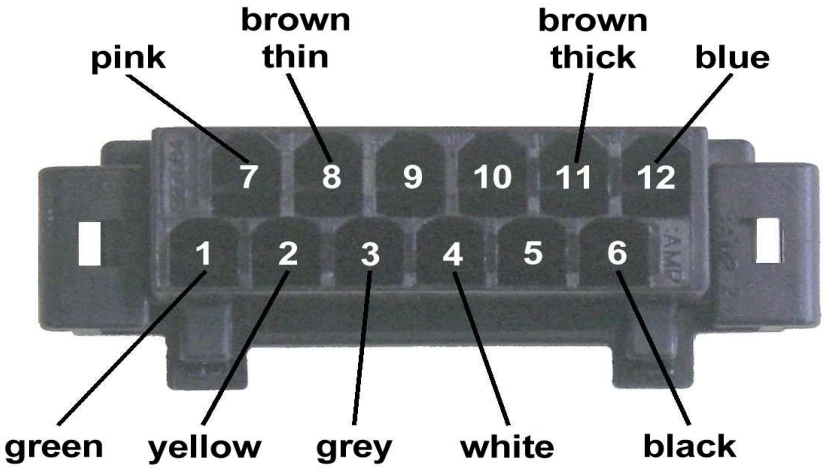
Prior to inserting contacts in the connector housing, **ensure that the contacts are in a faultless condition and are not bent. In particular, contact blades must not have excessive spacing**. Insert contacts in the connector housing according to the following sketch. Individual cable cores are marked in colours and connector-housing recesses are numbered to eliminate confusion.

> Please work very carefully, because once the contacts have been inserted, they cannot be removed without damage.

Ensure that each contact is fully inserted so that the contact blade is engaged, which can be heard as a click. After all contacts have been inserted, push the connector housing together in a vertical direction to the contacts.

6.5.1 Sketch of connector housing (rear view!!)

6-core cable: 3- core cable:



6.6 Power supply

Run the *AutoSat 2 Control* only on 12 V batteries or a battery charger or power pack supplying a continuous current of 10 Amps DC.

Warning:

For 24 Volt vehicle mains, a 24 V to 12 V converter will be required.

A 6 pole connector with a short cable is provided. Connect the 3 wires (red, black, blue) to the vehicle power supply with suitable connectors. The bipolar twin wire with attached circular plug is designed for the 12V supply of a satellite receiver.

To keep cable losses to a minimum. use a **cable with a cross section of at least 4 mm²** for the voltage supply. The AutoSat 2 should ideally be directly connected to the battery by a dedicated supply cable. Ensure that no other major users are connected to the same cable. If others are connected, the cable cross section must be adjusted to a suitable larger size.

Attention! If the power supply cable is altered or a different cable is used, make sure the polarity is correct. If the polarity of the supply voltage is wrong, the control box will be damaged.

Connect the thin blue cable (1 mm²) to terminal 15 (ignition on) or to D+ (alternator). This will ensure automatic retraction of the dish to the parking position when starting to drive. Both a 12 V and 24 V signal may be connected (applies ONLY to the D+ control cable).

7 Connection and initial operation

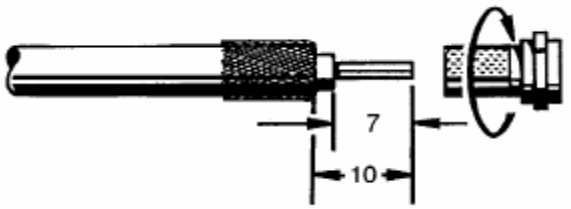
7.1 Mounting the control unit

To fix the control unit or the receiver, it is best to use double-sided adhesive tape **Scotch 3M** or **Tesa Power Strip.**

If screws are used, always make sure they do not make contact with the electronic circuit or cause any other damage.

7.1.1 Satellite aerial connector

The satellite aerial cable is terminated with an F-Connector on delivery. Check the connector for damage and good seating before mounting. The centre conductor must not be bent. If the aerial cable has been shortened or lengthened, a new F-Connector must be fitted. Either a crimp or screw connector may be used. In either case the cable must be prepared as shown in the following figure:



Warning! Take care, that no small wires of the outer screen touch the inner conductor when mounting the connector, causing a short circuit.

The aerial cable from the external unit is screwed to the left F-connection labelled **“in”**.

Warning! Do not use any tools to screw up a screw type F-Connector on the cable and to fix the connector at the F-connection. These connections should only be finger tight.

The right F-connection labelled **“out”** is the connection to the receiver.

7.1.2 Connection external motor unit

Prior to plugging in the connector to the external motor unit, check it again for correct seating of the contacts. If all contacts are fully inserted and in the correct positions (see page 21) the connector may be plugged in.

7.1.3 Connection power supply

Prior to connecting the control unit with the vehicle power supply, check the supply connector again, to avoid possible damage due to incorrect connections.

7.1.4 Connection receiver

The provided 6-pole connector plug comes with a ready-made 12V circular plug with a 2.3-mm diameter for all standard satellite receivers. This connector is designed for receivers with a maximum power input of 20 watts. If your satellite receiver has a different 12V-connector plug, you need to replace that plug.

The receiver is only supplied with 12V when the antenna is extended. This prevents the receiver from consuming power when the antenna is retracted.

7.1.4 Connecting an external control panel

There are two versions of the control panel. The mounted control panel is provided for mounting on furniture. With the assembly control panel a 15mm diameter hole for the cable feed-through must be drilled in a suitable location on the panel housing.
The external control panel is connected directly to the control box by an 8 pin patch cable. The external control panel has a 2m long mains lead. An overall length of up to a maximum of 10m is possible. Only use continuous fully shielded patch cables without extensions for this purpose.
The external control panel is connected to the western jack labelled **"control panel"** on the underside of the control box. Make sure that the connector locks into the jack properly.

7.1.5 Initial operation

If all the steps described have been carried out, the system may be operated. If you are not yet familiar with the details of operation, please read the Operating Instructions (page 9 – 16) first.

8 Fault elimination

Fault	Remedy
No Satellite found	1) Check, that there is a free line of sight to the Satellite. **Trees will block reception!** 2) Make sure, that the required Satellite can be received with your size aerial at your current location. 3) At the fringe of the Satellite footprint, change the Search mode from **"Course"** to **"Fine"** and repeat the search. 4) The Satellite search parameters have changed. Check with us, whether there are new parameters or order a current Flash card. 5) Check the Aerial cable to the external unit (tight fit of the connectors – break in the cable).
No picture, although the aerial is in a receiving orientation	1) Try other programs at the receiver. 2) Maybe the wrong satellite was found -, push the **"SAT"**button. 3) Check the connection to the TV set. If the connection is by coax cable check the TV settings (channel). If the connection is by SCART cable, the TV set must set to AV or channel 0.
Wrong Satellite found	1) Repeat the Satellite search: press **"SAT".**
Bad picture quality	1) Execute the **"Fine positioning"** function. 2) You are in the fringe zone of the Satellite footprint. 3) if 2) does not apply, check the aerial cable to the receiver. (tight fit of the connectors – break in the cable) 4) LNB has been turned – polarity incorrect.
Motor does not turn	1) Check that the Aerial is free to move. 2) Check the conductors of the motor cable: all contacts must be engaged tightly in the holes of the plug housing. 3) There is an obstacle between the Aerial and the roof (e.g. snow)!
Motor over current protection has tripped	1) Check that the Aerial is free to move. 2) There is an obstacle between the Aerial and the roof (e.g. snow)!
System shuts down immediately	1) Check the battery voltage. 2) Your vehicle was started.
Inexplicable error condition	1) Switch your *AutoSat 2 Control* off and then on again

9 Connecting to Internet (schematics)

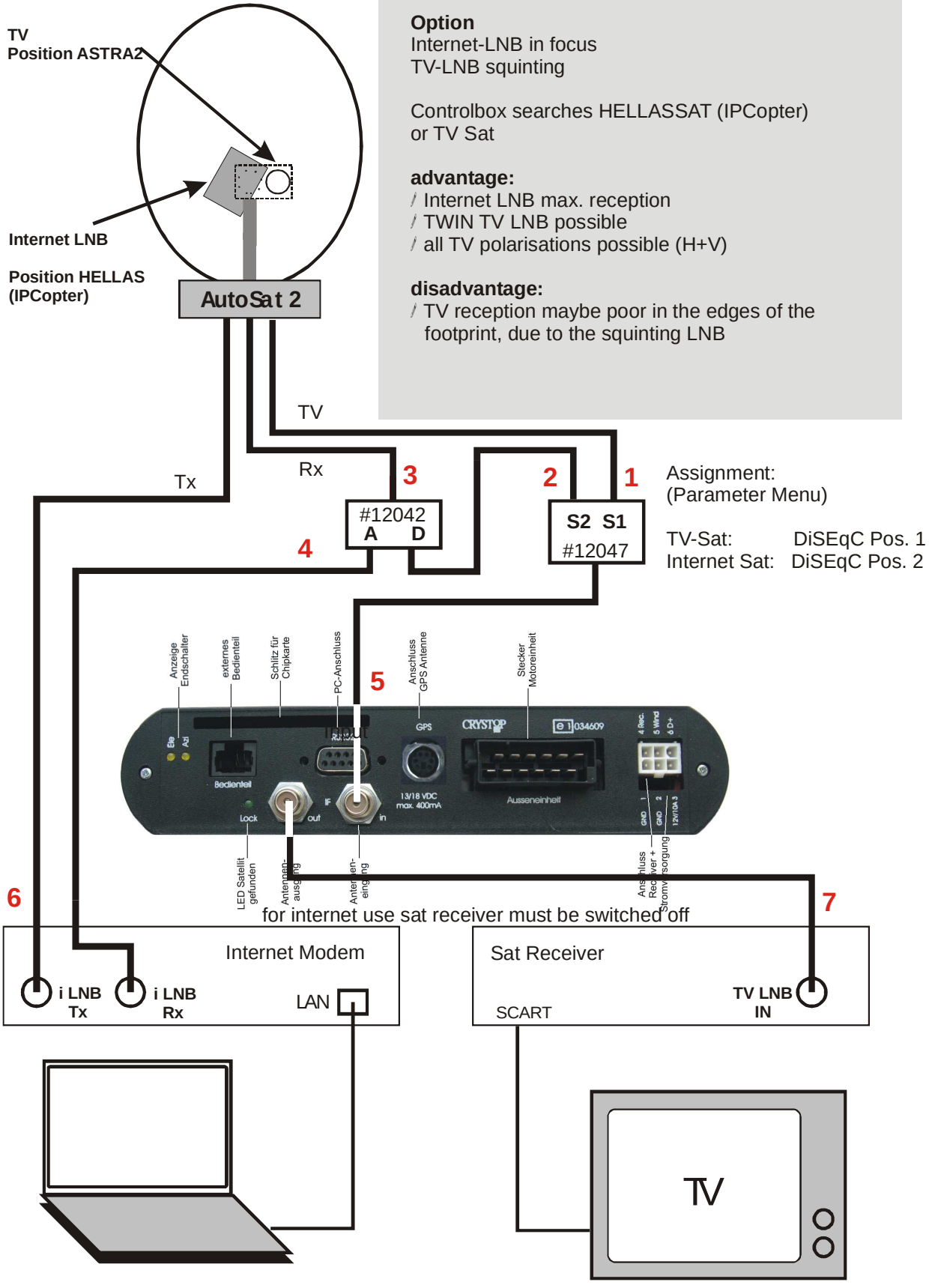
schematic for AutoSat2 Control Internet

Option
Internet-LNB in focus
TV-LNB squinting

Controlbox searches HELLASSAT (IPCopter)
or TV Sat

advantage:
/ Internet LNB max. reception
/ TWIN TV LNB possible
/ all TV polarisations possible (H+V)

disadvantage:
/ TV reception maybe poor in the edges of the footprint, due to the squinting LNB



10 Specification

Power supply:

Supply voltage (max. ratings)		10...15V DC
Voltage on control line D+		10...30V DC
Current / Power input		
Search mode typ.		3 A / 36 W
Reception mode typ.		0,01 A / 0,03 W
GPS (optional)		0.25 A / 3 W
Current limit, motors		approx. 8 A

LNB:

LOF		9.75 / 10.6 MHz
Noise level low / high band	single LNB	0.3 dB
	twin LNB	0.4 dB
LNB-control		14/18 V, max. 400 mA

Measurements:

Control unit:	200 x 150 x 70 mm (W x H x D)

Approval by the German Federal Motor Transport Authority (KBA) of the EEC type label (e1) according to the EMC Directive 2005/83/EG for installation and operation in motor vehicles.

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No warranty for information in this manual Subject to alteration without notice 12/09